
Amendments to the Specification

a1 [0010] Image sensor arrays may be designed to produce monochromatic images or color images. In a monochromatic images, each sensor pixel may be used to produce an image pixel in the output image. Hence, the number of image pixels in the output image is up to the number of sensor pixels in the array. A color image sensor array, however, uses two or more different adjacent pixels as a single "color pixel" where different pixels in the color pixel respectively sense light of different colors in the output radiation to produce a colored image pixel in the output image. For example, a color pixel may include three adjacent sensor pixels corresponding to the three primary colors of red, green, and blue. For example, a color pixel may include two green pixels, one red pixel, and one blue pixel in a Bayer pattern.

a2 [0014] One advantageous feature of HOEs for an optical mask layer for an image sensing array is that each HOE may include different sets of holograms for simultaneously performing different optical functions. For example, ~~the~~ a hologram for a lens function and a hologram for a color filter function may be included in a single HOE to operate independently ~~form~~ from each other without interference between the two different optical functions. In comparison, conventional optical designs generally require a lens array and a separate filter array stacked over each other on top of the sensing array.

a3 [0017] The holograms in the HOEs 122 separately focus the input radiation 130 into multiple beams 132 respectively directed to the photoreceptor areas 104 in different pixels. The location of the each photoreceptor area 104 may be either located in the center of the each pixel area 102 or off the center of each sensor pixel. In the latter case, the hologram in each HOE lens element 122 may be designed to focus the beam 132 at the off-center location to ~~maximum~~ maximize the collection efficiency.

a4 [0023] It is contemplated that each HOE pixel may include holograms respectively for light focusing and color filtering. For example, the image devices 100, 300, and 400 in FIGS. 1, 3, and 4, respectively, may use HOE layers with both types of holograms to simultaneously focus radiation into different pixels and filter colors of the input radiation. In FIG. 1, each HOE pixel 122 may be fabricated to include another color filtering hologram as in the HOE pixel ~~421~~ 411, ~~422~~ 412, or ~~423~~ 413 to also filter the selected color.